

Combining biochar and urea

Recommendations for Arid and Semi-Arid regions based on results on barley crop

1. How to prepare the mix

Step-by-step process:

- Mix biochar with 1/3 of the required urea in a water solution 10 days before field application. This allows biochar to be enriched with nitrogen.
- Stir occasionally to ensure even distribution.
- Let the water content gradually decrease before field application.
- Apply the mixture while still moist into the top 10 cm of soil for best results.
- Apply the remaining 2/3 of urea later, based on barley growth stages.

2. Recommended dose

For an expected barley yield of 50 q/ha:

- Fertilizer provided with mono-ammonium phosphate (MAP), potassium sulfate (K_2SO_4) and urea, equivalent to an input of 55 kg(N)/ha, 80 kg(P)/ha and 116 kg(K)/ha.
- **For 1 m²:**
 - 15.4 g MAP (N-P-K 12-52-0),
 - 22.9 g of K_2SO_4 (N-P-K 0-0-51),
 - 7.9 g urea (N 46%).
- **Biochar:** 0.7 t/ha/year

For more information, see also biochar recommendation sheet

3. Benefits of using biochar & urea mix



- ✓ Enhances soil water retention with biochar application
- ✓ Provides essential nutrients to plants, enhance barley yield by 38% to 85%.
- ✓ With staggered N application, sufficient N at different stages of plant growth to achieve good yield and grain quality
- ✓ Potentially improves soil fertility in the long term (not yet proven)
- ✓ Stores carbon in the soil (carbon sequestration)

4. Things to consider



- ✗ Requires work and monitoring prior to field application
- ✗ Requires purchasing mineral fertilizers
- ✗ Method which does not fully fit into the circular economy with the use of fertilizers